

CLAIMS

What is claimed is:

1. A method for registering and authenticating a wireless device, comprising the steps of:

5 providing a controller having a discovery mode and an operating mode, in the discovery mode the controller is capable of registering wireless devices, in the operating mode the controller is capable of receiving transmissions from a wireless device that has been registered;

10 providing a wireless device which is capable of communicating wirelessly with the controller, the wireless device having an actuator for initiating at least one transmission of registration data, the registration data containing a unique token for verifying the identity of the wireless control device;

placing the controller into the discovery mode;

15 actuating the actuator of the wireless device to wirelessly transmit the registration data from the wireless device to the controller; and returning to the operational mode of the controller, whereby the wireless device is registered with the controller.

20 2. A method for registering and authenticating a wireless device according to claim 1, wherein the wireless device comprises an RF transmitter and wherein the controller is capable of receiving RF transmissions from the wireless device.

25 3. A method for registering and authenticating a wireless device according to claim 2, wherein in the operational mode, the wireless device transmits RF transmissions via the RF transmitter to the controller.

4. A method for registering and authenticating a wireless

device according to claim 1, wherein the wireless device further comprises an IR transmitter and wherein the controller is capable of receiving IR transmissions from the wireless device.

5 5. A method for registering and authenticating a wireless device according to claim 4, wherein in the discovery mode the wireless device transmits the registration data via the IR transmitter to the controller.

10 6. A method for registering and authenticating a wireless device according to claim 3, wherein the wireless device further comprises an IR transmitter and wherein the controller is capable of receiving IR transmissions from the wireless device.

15 7. A method for registering and authenticating a wireless device according to claim 6, wherein in the discovery mode the wireless device transmits the registration data via the IR transmitter to the controller.

20 8. A method for registering and authenticating a wireless device according to claim 1, wherein the actuator of the wireless device comprises a mechanical control, an electrical control, a software control, a physical control, a tactile control, or an audible control.

25 9. A method for registering and authenticating a wireless device according to claim 1, wherein the wireless device is a wireless sensor having a sensor front end for receiving event data.

10. A method for registering and authenticating a wireless device according to claim 9, wherein the wireless sensor includes a non-volatile storage device for storing a serial number associated with the sensor

device.

11. A method for registering and authenticating a wireless device according to claim 10, wherein the non-volatile storage device further stores functional parameters for the sensor front end.

12. A method for registering and authenticating a wireless device according to claim 9, wherein the serial number forms a part of the registration data.

13. A method for registering and authenticating a wireless device according to claim 12, wherein the functional parameters for the sensor device are transmitted along with the registration data.

14. A method for registering and authenticating a wireless device according to claim 1, wherein the controller returns to the operational mode automatically after at least one wireless device has been successfully registered.

15. A method for registering and authenticating a wireless device according to claim 1, wherein the controller returns to the operational mode automatically after a preselected time interval.

16. A method for registering and authenticating a wireless device according to claim 1, wherein the controller includes an actuator for switching between the operational mode and the discovery mode.

17. A method for registering and authenticating a wireless device according to claim 16, wherein the actuator of the controller comprises

a mechanical control, an electrical control, a software control, a physical control, a tactile control, or an audible control.

5 18. A method for registering and authenticating a wireless device according to claim 1, wherein the at least one transmission of registration data comprises a first signature byte for identifying that the at least one transmission is a registration transmission.

10 19. A method for registering and authenticating a wireless device according to claim 1, wherein the at least one transmission of registration data comprises a plurality of sequential transmissions.

15 20. A method for registering and authenticating a wireless device according to claim 19, wherein one of the registration data transmissions comprises a first signature transmission for identifying that the subsequent transmissions are registration transmissions.

20 21. A method for registering and authenticating a wireless device according to claim 20, wherein one of the registration data transmissions comprises a serial number for identifying the wireless device.

25 22. A method for registering and authenticating a wireless device according to claim 21, wherein the serial number is a unique serial number.

 23. A method for registering and authenticating a wireless device according to claim 21, wherein one of the registration transmissions includes a second signature transmission.

24. A method for registering and authenticating a wireless device according to claim 21, wherein the second signature byte is identical to the first signature transmission.

5 25. A method for registering and authenticating a wireless device according to claim 23, wherein at least one of the registration transmissions comprises an additional serial number transmission.

10 26. A method for registering and authenticating a wireless device according to claim 23, wherein the at least one of the registration transmissions includes a circular redundancy check transmission.

15 27. A method for registering and authenticating a wireless device according to claim 25, wherein the at least one circular redundancy check transmission includes a plurality of circular redundancy check transmissions.

20 28. A method for registering and authenticating a wireless device according to claim 21, wherein at least one of the registration transmissions includes a circular redundancy check transmission.

25 29. A method for registering and authenticating a wireless device according to claim 26, wherein the at least one circular redundancy check transmission includes a plurality of circular redundancy check transmissions.

30. A method for registering and authenticating a wireless device according to claim 1, wherein the at least one transmission of registration data includes at least nine transmissions comprising a first

signature transmission, a first serial number transmission, a first data
transmission, a second serial number transmission, a third serial number
transmission, a second data transmission, a second signature transmission, a
first circular redundancy check transmission, and a second circular redundancy
check transmission.

31. The method according to claim 1, wherein the data
transmission includes a synchronization pulse.

32. The method according to claim 31, wherein the
synchronization pulse is located at the start of each data transmission.

33. The method according to claim 31, wherein the
synchronization pulse comprises at least one ON bit and at least one OFF bit.

34. The method according to claim 31, wherein the
synchronization pulse comprises two ON bits and one OFF bit.

35. The method according to claim 33, wherein the
controller resynchronizes at the trailing edge of the at least one ON bit.

36. The method according to claim 34, wherein the
controller resynchronizes at the trailing edge of the second ON bit.

37. The method according to claim 31, wherein the
controller resynchronizes at the trailing edge of the synchronization pulse.

38. The method according to claim 1, wherein the wireless
device comprises a primary channel transmitter and wherein the controller is

capable of receiving secure primary transmission from the wireless device.

39. The method according to claim 38, wherein the wireless device further comprises a registration channel and wherein the controller is capable of receiving the registration transmissions from the wireless device.

40. The method according to claim 1, wherein the data that allows the controller to operate the wireless device includes parameters, device descriptors, and rules associated with the operation of the wireless device.

41. A protocol for registering and authenticating wireless devices comprising:

a multi-byte transmission of data comprising:

at least one signature byte;

at least one data byte;

at least one serial number byte; and

at least one circular redundancy check byte;

wherein each byte of the multi-byte transmission comprises at least one synchronization bit.

42. The protocol according to claim 41, wherein the at least one signature byte comprises a first signature byte and a second signature byte.

43. The protocol according to claim 42, wherein the at least one circular redundancy check byte includes a first circular redundancy check byte and a second circular redundancy check byte.

44. The protocol according to claim 43, wherein the at least

one serial number byte comprises a plurality of serial number bytes.

45. The protocol according to claim 44, wherein the at least one data byte comprises a plurality of data bytes.

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46. The protocol for registering and authenticating a wireless device of claim 41, wherein the multi-byte transmission of data comprises a first signature byte, a first serial number byte, a first data byte, a second serial number byte, a third serial number byte, a second data byte, a second signature byte, a first circular redundancy check byte, and a second circular redundancy check byte.

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47. The protocol for registering and authenticating a wireless device according to claim 41, wherein the synchronization bit is located at the start of the transmission.

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48. The protocol for registering and authenticating a wireless device according to claim 47, wherein the at least one synchronization bit comprises at least one ON bit and at least one OFF bit.

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49. The protocol for registering and authenticating a wireless device according to claim 47, wherein the synchronization bit comprises two ON bits and one OFF bit.

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50. The protocol for registering and authenticating a wireless device according to wireless device according to claim 41, wherein the multi-byte transmission further comprises encoded data that allows a controller to interface with a wireless device.

51. The protocol for registering and authenticating a wireless device according to claim 41, wherein the protocol is a one-way protocol.

5 52. A system for registering and authenticating a wireless device, comprising:

a controller having a discovery mode and an operating mode, in the discovery mode the controller is capable of registering wireless devices, in the operating mode the controller is capable of receiving transmissions from a wireless device that has been registered;

10 a wireless device which is capable of communicating wirelessly with the controller, the wireless device having an actuator for initiating at least one transmission of registration data, the registration data containing a unique token for verifying the identity of the wireless control device;

15 whereby the wireless device is registered upon actuation of the wireless device actuation when the controller is in discovery mode by wirelessly transmitting the registration data from the wireless device to the controller.

20 53. A system for registering and authenticating a wireless device according to claim 52, wherein the wireless device comprises an RF transmitter and wherein the controller is capable of receiving RF transmissions from the wireless device.

25 54. A system for registering and authenticating a wireless device according to claim 53, wherein the wireless device further comprises an IR transmitter and wherein the controller is capable of receiving IR transmissions from the wireless device.

55. A system for registering and authenticating a wireless device according to claim 54, wherein in the discovery mode the wireless device transmits the registration data via the IR transmitter to the controller.

5 56. A system for registering and authenticating a wireless device according to claim 52, wherein the actuator of the wireless device comprises a mechanical control, an electrical control, a software control, a physical control, a tactile control, or an audible control.

10 57. A system for registering and authenticating a wireless device according to claim 52, wherein the wireless device is a wireless sensor having a sensor front end for receiving event data.

15 58. A system for registering and authenticating a wireless device according to claim 57, wherein the wireless sensor includes a non-volatile storage device for storing a serial number associated with the sensor device.

20 59. A system for registering and authenticating a wireless device according to claim 57, wherein the serial number forms a part of the registration data.

25 60. A system for registering and authenticating a wireless device according to claim 52, wherein the at least one transmission of registration data comprises a first signature byte for identifying that the at least one transmission is a registration transmission.

61. A system for registering and authenticating a wireless device according to claim 52, wherein the at least one transmission of

registration data comprises a plurality of sequential transmissions.

62. A system for registering and authenticating a wireless device according to claim 61, wherein one of the registration transmissions
5 comprises a serial number for identifying the wireless device.

63. A system for registering and authenticating a wireless device according to claim 62, wherein one of the registration transmissions includes a second signature transmission.
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64. A system for registering and authenticating a wireless device according to claim 62, wherein the second signature byte is identical to the first signature transmission.
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65. A system for registering and authenticating a wireless device according to claim 63, wherein at least one of the registration transmissions comprises an additional serial number transmission.
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66. A system for registering and authenticating a wireless device according to claim 63, wherein the at least one of the registration transmissions includes a circular redundancy check transmission.
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67. A system for registering and authenticating a wireless device according to claim 52, wherein the at least one transmission of registration data includes at least nine transmissions comprising a first signature transmission, a first serial number transmission, a first data transmission, a second serial number transmission, a third serial number transmission, a second data transmission, a second signature transmission, a first circular redundancy check transmission, and a second circular redundancy
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check transmission.

68. The system according to claim 52, wherein the data transmission includes a synchronization pulse.

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69. The system according no claim 68, wherein the synchronization pulse is located at the start of each data transmission.

70. The system according to claim 52, wherein the synchronization pulse comprises at least one ON bit and at least one OFF bit.

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71. The system according to claim 52, wherein the data that allows the controller to operate the wireless device includes parameters, device descriptors, and rules associated with the operation of the wireless device.

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72. A wireless transmitter comprising:
a circuit for transmitting a multi-byte transmission of data comprising;

an actuator in communication with the transmitter
circuit for initiating data transmission;

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the multi-byte transmission of data comprises:

at least one signature byte;

at least one data byte;

at least one serial number byte; and

at least one circular redundancy check byte;

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73. A controller for receiving wireless transmissions comprising:

an operating mode and a discovery mode, in the

discovery mode the controller is capable of registering wireless devices, in the operating mode the controller is capable of receiving wireless multi-byte transmission of data from a registered wireless device;

the multi-byte transmission of data comprising:

5 a multi-byte transmission of data comprising:

at least one signature byte;

at least one data byte;

at least one serial number byte; and

at least one circular redundancy check byte.

10 74. A method for registering and authenticating a wireless device, comprising the steps of:

providing a controller having a discovery mode and an operating mode, in the discovery mode the controller is capable of registering wireless devices, in the operating mode the controller is capable of receiving transmissions from a wireless device that has been registered;

15 providing a wireless device which is capable of communicating wirelessly with the controller, the wireless device being capable of transmitting a periodic heartbeat transmission which contains registration data;

20 placing the controller into the discovery mode;

transmitting a heartbeat transmission of the wireless device to wirelessly transmit the registration data from the wireless device to the controller; and

returning to the operational mode of the controller,

25 whereby the wireless device is registered with the controller.

75. A system for registering and authenticating a wireless device, comprising:

a controller having a discovery mode and an operating mode, in

the discovery mode the controller is capable of registering wireless devices, in the operating mode the controller is capable of receiving transmissions from a wireless device that has been registered;

5 a wireless device which is capable of communicating wirelessly with the controller, the wireless device being capable of transmitting a periodic heartbeat transmission which contains registration data,

10 whereby the wireless device is registered by wirelessly transmitting the registration data during the transmission of the heartbeat transmission of the wireless device to the controller when the controller is in discovery mode.

76. The method for registering and authenticating a wireless device according to claim 1, wherein the registration data contains data that allows the controller to operate the wireless device.

15 77. The system for registering and authenticating a wireless device according to claim 52, wherein the registration data contains data that allows the controller to operate the wireless device.